IMTM 3019:502

April 9th, 2025

Josh Plante

Assignment #4 - Project Report & Reflection

Project Report Summary

I was very pleased that my final work ended up closely resembling both my thesis and my brainstorm sketches. I was able to accomplish my personal goals with this work to create an interactive sound based installation.

I completed all three technical aspects of the project I set out to achieve, including the hand tracking drum set, the hand tracking eq changer, and the DDR Mat sound integration. I was also able to successfully reserve my equipment, set up the installation space, and observe interaction with my piece.

Good things I noticed included: smiles, peer-tutoring, interaction, engagement with the piece, and I observed wonder and curiosity with my piece. Some detriments I noticed included: lack of observation regarding the instructions and guide, accessibility issues, and lack of cohesion between the exhibition space, the audience, and my piece.

Written Reflection

My final piece, Play-testing v.13 was successful. Using my research, a DDR Mat, Touchdesigner, and the MediaPipe plug-in I was able to create an engaging sound-creation installation.

My work heavily involved the use of integration, especially through Touchdesigner. Works like Blakensmith's *#Genuary* (2025) series and Lucio Arese's *Visual Guitar* (2025) strengthened my understanding of the programs capabilities, as well as influenced my piece's direction by informing me of the style and tropes of interactive audiovisual works.

Through my research and exploration of the interactive media arts field, I discovered many other artists who are doing similar things to me like Prisha Jain, creator of the *Chromadance* (2024) installation, which similarly to my own piece made use of a dance mat as means of interaction between human and technological systems. Or Christopher Hall, a Touchdesigner artist who in 2020 created an audio visualizer for the Harmonix Guitar Hero Controller which sparked my interest in plastic instruments as an in-point for exploration between sound and human interaction.

Informed by the works listed above, the jump between my fall 2024 project and this

winter's project was the relationship between the audience and the way that sound is created in my work. In *Clone Hero v.22* (my fall project) the Guitar Hero instrument was used as a proxy that audiences would interact with to create sound through, whereas in *Play-testing v.13* (my winter project) the audience becomes the proxy, they become the instrument, and the means of interaction between the system and the audience.

Witnessing my work being interacted with was important to me, and I wrote down my observations to reflect on later. I wanted to compare my piece's relationship to peer-tutoring to Johanna Hoysniemi's paper regarding peer-tutoring effectiveness on interactive computer programs. Of which I am happy to report positive results. I witnessed multiple instances of peer-tutoring of my piece, it seemed that it was easy enough for amateur users to explain the system to new users, which according to Hoysniemi's paper indicates effective and intuitive design.

From inception, I had envisioned my work to have the qualities of an "Exergame" as defined by Debra Lieberman. It would have the effects of strengthening motor and cognitive skills, sensory learning, creating social connections, and being a way to exercise. I do believe my work accomplished some of these goals. It certainly was a social platform, I watched users compare the sounds they could create and show off to each other. However I am unsure if users typically engaged for long enough for significant improvements in sensory learning and effects of exercise to show.

Overall, *Play-testing v.13* was the culmination of a deep dive into interactive artwork that included learning about visual coding software, installation and exhibition processes, and local and international artist communities and networks. Importantly I also learned about myself and my artwork, where it belongs, its ideal audience, and the future directions I can take my interactive body of works. I am glad I got the opportunity to exhibit my work to a wide audience, all the ups and downs came with lessons learned and valuable experience I can take into future endeavors.

Works Cited

Arese, Lucio. *Visual Guitar*. MIDI Guitar, Touchdesigner, JAM Origin, 2025, www.lucioarese.net/visual-guitar/. Accessed 31 Jan. 2025

Blankensmith, Torin. *#Genuary Series*. Touchdesigner, Jan. 2025, www.youtube.com/@blankensmithing/shorts. Accessed 28 Jan. 2025.

Höysniemi, Johanna, et al. "Using Peer Tutoring in Evaluating the Usability of a Physically Interactive Computer Game with Children." *Interacting with Computers*, vol. 15, no. 2, Apr. 2003, pp. 203–25, https://doi.org/10.1016/s0953-5438(03)00008-0. Accessed 17 Oct. 2023.

Prisha Jain*, Chromadance*, 2024

The Interactive & Immersive HQ. "Patchy (Christopher Hall) - Guitar Hero, Synth, OSC, AxiDraw - Championship TouchDesigner Project." *YouTube*, 22 July 2020, www.youtube.com/watch?v=EhAj2Tuf6HE. Accessed 23 Oct. 2024.

Lieberman, Debra A. "Dance Games and Other Exergames: What the Research Says." *University of California, Santa Barbra*, Apr. 2006, web.archive.org/web/20111103034538/http:/www.comm.ucsb.edu/faculty/lieberman/exergames.htm. Accessed 23 Oct. 2024, via wayback machine.

Updated Annotated Bibliography

Anzola, Laura, et al. *Impossible Geometries*, 2023. THEMUSEUM, Kitchener. themuseum.ca/exhibitions/eyepool-presents-impossible-geometries/.

In 2023, THEMUSEUM, located in Kitchener, Ontario, collaborated with the Calgary-based company Axis-Z Media Arts to create "Impossible Geometries" an "immersive digital gallery". The actual artists who created the work are Laura Anzola, Matthew Waddell, and Darren Young.

The piece is highly technical in nature, using dozens of computers and projectors to animate and immerse visitors in curated spaces. It also operates on TouchDesigner. Twelve ceiling-mounted computer tracking devices are used to track guests throughout the space, allowing animations to respond to human movement. My favourite segment of the work was the 'floor-is-lava' style game, where tiles needed to be activated by stepping on them to save yourself from the animated lava.

This was my initial inspiration for the final project. I wanted to animate an audiovisual interactive experience. "Impossible Geometries" creates a "play zone" for viewers, transforming and blurring the lines between game, artwork, and interaction. Personally, I have spent a lot of time watching people interact with the space and noticed that nearly everyone who tries it is impressed by its scale and immersion. I am inspired by the use of visual programming and space in the artwork and would argue the work is successful in that way. Using ideas from Anzola's work, I wanted to create a piece that evokes similar feelings; while also centering my work more around interaction.

Arese, Lucio. *Visual Guitar*. MIDI Guitar, Touchdesigner, JAM Origin, 2025, www.lucioarese.net/visual-guitar/. Accessed 31 Jan. 2025.

Composer, filmmaker, and visual artist Lucio Arese uses his guitar and Touchdesigner as a medium to conduct research into audio reactive visuals. Using JAM Origin 3 as a MIDI transcriber, Lucio is able to translate his physical guitar sounds into usable and transformable data on touchdesigner. Arese creates beautifully rendered abstract videos, using sound inputs to inform the shapes, colours, and timings we see on screen. What I find most compelling about Arese's work is the clear connection between his input and the final audio visualizer. His final videos showcase the connection excellently, and Arese's expertise in both fields is demonstrated well.

My recent practice has also been connected heavily to audio visualization. I've found that colour and simple shape do work well to reinforce the creation aspect of sound-creation. Audiences will associate a change in colour with a new sound, and alterations in volume and pitch with alterations of hue, shape, colour, and other variables. My project will focus less however, on a specific audio visual goal, and will use Arese's ideas as a springboard to create an overall multi-sensory experience.

Blankensmith, Torin. *#Genuary Series*. Touchdesigner, Jan. 2025, www.youtube.com/@blankensmithing/shorts. Accessed 28 Jan. 2025.

Torin Blankensmith is a Toronto-based creative technologist. His *#Genuary* series (2025) is a body of 31 generative artworks, each created with different stipulations and experimental focuses. Blankensmith uses touchdesigner as a method in which to explore a majority of his various prompts. The works include audio reactive, interactive inputs, and abstract video pieces that explore the potential of Touchdesigner to create generative work, as well as the use of machine learning tools to track human inputs like posing, facial tracking, and hand tracking to generate inputs.

The aspect of generation has always been a thread through my pieces, the goal of my work has always been to foster experimentation from audiences, and generation is a great way to create unique experimental opportunities. Torin's work is a great resource for the possibilities of generation in my own work, and I am interested in exploring some of his concepts further, possibly with the use of a "bird's-eye" projector to simulate some generative visuals to go with the sound-creation.

Blankensmith, Torin, and Dom Scott. “MediaPipe TouchDesigner Plugin.” *GitHub*, 19 Nov. 2023, github.com/torinmb/mediapipe-touchdesigner. Accessed 2 Feb. 2025.

Developed by artists and programmers Torin Blankensmith and Dom Scott. "MediaPipe" is a web-based machine learning application that allows for eye and facial tracking, object recognition, and tracks hand and body positions as inputs in Touchdesigner. MediaPipe is known widely by the Touchdesigner community as a popular and effective open-source extension, it has been used by artists like Torin Blankensmith and Lucio Arese to create amazing interactable systems and artworks.

I am integrating MediaPipe into my own work by using its hand-tracking capabilities. I am choosing to track hands because there are many points to track (fingers, finger tips, open/closed, x,y,z for each) which leads to more creation opportunities and explorations for audiences. On top of that, people are creative and familiar with their bodies, chances are high that certain participants will experiment with different things like closing their hands, or shaking really fast etc. Technically, the program has quite a fast response time and is able to track the positions of the hands smoothly.

Foster, Ryan "Srylain". *Clone Hero*. 2017.
&
Triforce, Liam. "Guitar Hero & Rock Band Retrospective." *YouTube*, 30 Apr. 2024, www.youtube.com/watch?v=P2O7rkgk6fw. Accessed 7 Oct. 2024.

Clone Hero is a software clone of the 2005 cult classic "Guitar Hero" developed by Harmonix. Liam Triforce's video essay tells the story of Harmonix's masterpiece that was "Guitar Hero", it was a fad in the early 2000's that saw Harmonix' vision of musical amateurs using video gaming to engage with their favourite songs and music. While the "Guitar Hero" series has since become effectively canceled, Ryan Foster's 2017 software clone "Clone Hero" has risen up to become the new heart of the so-called "plastic instrument" community. I discovered it while researching expert "Guitar Hero" creators on YouTube, such as creator "Acai".

I ended up utilizing this program in my final piece for a previous installation. While it is not included in my new project, the inspiration in terms of open community development, shared experience, and novice-musical engagement are still present (particularly through the use of new "Mediapipe" external machine learning files). I am also attempting to explore similar ideas to Harmonix' company mission statement stated on their website as… "invent novel ways for people to engage with music." and to "connect people to each other through music and play." Harmonix, and Foster's, work have been significant in shaping the musical-integration goals of my research.

Höysniemi, Johanna, et al. "Using Peer Tutoring in Evaluating the Usability of a Physically Interactive Computer Game with Children." *Interacting with Computers*, vol. 15, no. 2, Apr. 2003, pp. 203–25, https://doi.org/10.1016/s0953-5438(03)00008-0. Accessed 17 Oct. 2023.

This peer-reviewed journal focuses on how children teach other children to interact with computer games. I found the article interesting for many reasons, but mainly how to create software and systems that are usable by the general public and children. The article uses a test game and asks children to play it, and then teach it to each other. Hoysniemi and their research team are recording how easy and fast it is for children to explain these interactive systems, noting what parts of their game are effective and which are not.

It's often said that good design is invisible, and in my final work I want the audience to be able to effortlessly intuit what interactions were possible in my installation space. Some ways I plan to integrate these learning methods are: dim lighting to focus attention, visuals that add to users' understanding, and simple instructional diagrams. The teaching aspect of the journal also plays a part here, my final work benefits from audiences being able to teach the basics to others, the same way as described by Höysniemi. If my design is simple enough for other first time users to be able to turn around and teach a friend, then my design is effectively usable according to Höysniemi and her team.

Secondarily, her studies also play a role in how I conduct field testing for my final work. I will be considering teachability as a measure for how simple it is for audiences to understand how to engage with my work. Finally, I may choose to include a pamphlet, panel, or other diagrams as a supplement to guide users seeking clarification or further understanding of how to interact with my piece.

Lieberman, Debra A. "Dance Games and Other Exergames: What the Research Says." ***University of California, Santa Barbra*****, Apr. 2006, web.archive.org/web/20111103034538/http:/www.comm.ucsb.edu/faculty/lieberman/exergames.htm. Accessed 23 Oct. 2024, via wayback machine.**

Seeing as how arcade and rhythm games became so popular in the late 90's and 2000's Debra Lieberman's 2006 research paper about dance and rhythm games comes at a crucial time. It explores the history, and helps us define the core principles and benefits of what she defines as "Exergames" (games that provide exercise for the player). Lieberman notes the rise of both in-person and at home aerobic exercises set to music. She also explores the benefits of "Exergames" noting improved cardio-vascular health, weight management, reduction of anxiety and stress, improved sensory and motor learning, and improved cognitive alertness and performance. The note about improved sensory and motor learning is interesting to me, as a younger demographic definitely resonates as a potential audience for my work.

This research was really important for my work, I was really curious to see how closely my own work would mimic Lieberman's "Exergame's". I would like for the final work to act like an "Exergame" and provide visitors with the associated benefit's, but I believe this could be pushed further. I think Laura Anzola's "Impossible Geometries" is a great example of an artwork that is an "Exergame", and interestingly, many other rhythm games fall under this category like Beat Saber (2018), Samba de Amigo(1999), and Step Maniax(2017). I find the connection between music and movement a really compelling artistic thread to pull, especially the connection between movement/exercise and improved sensory and motor learning. Looking at my work through a musical literacy lens also shows this connection.

Ricardo Pedrosa, and Karon MacLean. "Perceptually Informed Roles for Haptic Feedback in Expressive Music Controllers". ***Haptic and Audio Interaction Design : Third International Workshop, HAID 2008, Jyväskylä, Finland, September 15-16 2008 : Proceedings*****, edited by Antti Pirhonen and Stephen Brewster, Springer, Cop, 2008, pp. 21–29.**

Haptic and Audio Interaction Design is an international workshop of various theoretical and technical professionals from computer science, music, engineering, design and other related fields, that seeks to share and improve knowledge on haptic and audio interaction for various software and

applications. The book contains thirteen papers that were submitted to be reviewed at the event. While all the work related to haptics and audio in some way, I found the most applicable work was authored by Ricardo Pedrosa and Karon MacLean from the University of British Columbia. Titled "Perceptually Informed Roles for Haptic Feedback in Expressive Music Controllers" Pedrosa and MacLean's paper explores the relationship between acoustic instruments and digital-haptic systems of creating music; they come to the conclusion that haptics need special attention, care, and an iterative design cycle that involves testing and adjusting parameters to create more natural acoustic experiences. One especially interesting quote states "The design of each flavor of haptic feedback is done in separate stages and is in-corporated into the general process at different times. We base this approach on the possibility of separating the force feedback from the tactile feedback channels to address different interface features: the former to foster controllability and the latter to foster the feeling of using a music instrument. "

I found lots in Pedrosa and MacLean's paper that I can use to improve my approach to creative my system. How vital the different interactive components are. In my project the DDR mat will provide the greatest haptic sense to users, so I will have to be very intentional in its outputs, and test how people approach the system before fine-tuning haptic, audio, or visual elements. The paper cites "Gillespie [11] provided a broad definition of a music instrument as: “a device which transforms mechanical energy (especially that gathered from a human operator) into acoustical energy” which forces me to consider my work as an instrument of some kind. When classifying my work, I will have to take this into account.

Schimmel, Janne. *Case Mod 3*. 2023.

Janne Schimmel's 2023, "Case Mod 3" is remarkable to me in its concept. Schimmel pays such close attention to the detail and presentation on the case of a video game controller that it creates a new perspective on gaming as a whole. It is a critique in a way, on our unappreciative views towards the material that houses our game equipment. By giving a game console an organic case, and custom games, Schimmel was able to create an art piece that gets audiences to question why our consoles and controllers are made the way they are, and if it's really the best way. Both hardware and software were modded. Schimmel creates a new kind of object.

My original entry point into this research topic was my utilization of gaming devices as input for audio creation. Through past works I have deepened my knowledge of the different effects and experiences that come with different input devices. Everyone has their own preferences and strengths when it comes to input collection devices (controllers, motion detection, audio detection, plastic instruments, midi boards, etc). Schimmels work allowed me to consider the possibilities of modded input devices, and custom controllers, or in my installation's case, organic input in the form of hand gesturing.

User Friendly Sounds. “Ableton 12 Patching Tips | Game Controller Ableton | User Friendly.” *YouTube*, 20 Oct. 2024, www.youtube.com/watch?v=keyfoXh_eaQ. Accessed 4 Nov. 2024.

Composer User Friendly Sounds uses a Playstation 4 "DuelShock 4" controller as input into AbletonLive in order to create live music. By hooking up his controller to the software, the various controller inputs are able to control any aspect of the DAW and can play live, prerecorded, and looped sounds all at once and with an easily accessible input device, hence the name, User Friendly Sounds.

Pushing his concept further, Ableton's data is linked to touchdesigner, and User Friendly Sounds is able to create live audio visualized sound performances, all with a simple controller.

This work was very influential in reinforcing my piece's use of simple input methods. I want to create a system that is easy to pick up and play, but also complex, and varied. Something people will want to spend time with to see how they can improve experiment further within the confines of my system. A simple input method is also a great entry point and links nicely with a few other ideas explored in my project like peer-tutoring, audience engagement, and low-barrier interaction.

The Interactive & Immersive HQ. "Patchy (Christopher Hall) - Guitar Hero, Synth, OSC, AxiDraw - Championship TouchDesigner Project." *YouTube*, 22 July 2020, www.youtube.com/watch?v=EhAj2Tuf6HE. Accessed 23 Oct. 2024.

Christopher Hall is a multimedia artist that specializes in Touchdesigner and programming artworks, his experimental piece was published on The Interactive & Immersive HQ's YouTube page, which is a group founded by and for Touchdesigner artists.

Hall's work demonstrates his program which turns inputs made from a Harmonix brand Guitar Hero controller into a visual and audio visualization. Hall uses cubes to represent different tones created by mapping buttons to different synth sounds within his program, and using the frequencies to control the movement, rotation and scale of colorful abstract cubes. Overall the piece lacked in terms of presentation, but was a great demonstration of the technical and creative capabilities of the Touchdesigner software, and its amazing ability to connect together electronics be it camera feeds, audio signals, video, physical computing devices, or plastic instruments.

In my own work, I use a similar making method to Hall. Brainstorming possible interactions between not only electronic devices, but also the human relationship and feedback we receive from participating in these interactive systems. Hall's work also in part inspired my work's goals to create cohesive and interactive audiovisual experiences for audiences. Lots of traits from Hall's work take shape in other artists' audiovisual reactive works. One big trend is abstract shapes and visuals, This can be seen in Halls work, Lucio Arese's *Visual Guitar (*2025), Prisha Jain's *Chromadance* (2024), and even my own piece from last semester, *Clone Hero v.22* (2024)

Mavis, Morgan. "Installation Guidelines and Ignite Gallery Presentation." Studio Practice Week Seven, 5 May 2025, OCAD U, Toronto, Canada. Guest Lecture.

In week 7 of studio practice class we had Morgan Mavis of the Ignite Gallery come to speak about installing artworks. She has had extensive experience in this field both theoretically as an instructor of museum studies at UofT, but also practically during her 9 years of experience installing and assisting to curate student exhibitions.

During her lecture, Mavis spoke about Installation lighting, painting, plinths, artists statements, and other aspects of artwork installation that applied to our own works. She also came with the guidelines for the Ignite Gallery's installations, which were pretty particular. She also had such confidence and experience in the field it was refreshing to not be around someone nervous to exhibit work.

In my own work, I had to balance adhering to Mavis' installation standards with accomplishing my install in a cost and time effective manner. Lots of guides that she presented were just that, guidelines. While adhering to them would improve the presentation of my work, it was necessary for me to cut

corners, and ignore certain accessibility requirements in order to have work that was exhibition ready. One aspect which I did take her advice literally was deciding the height of my webcam from the floor, as it was the purpose of the webcam to track users hands, so I measured the height of the camera to be the same as the ideal eye level for paintings in the Ignite gallery.

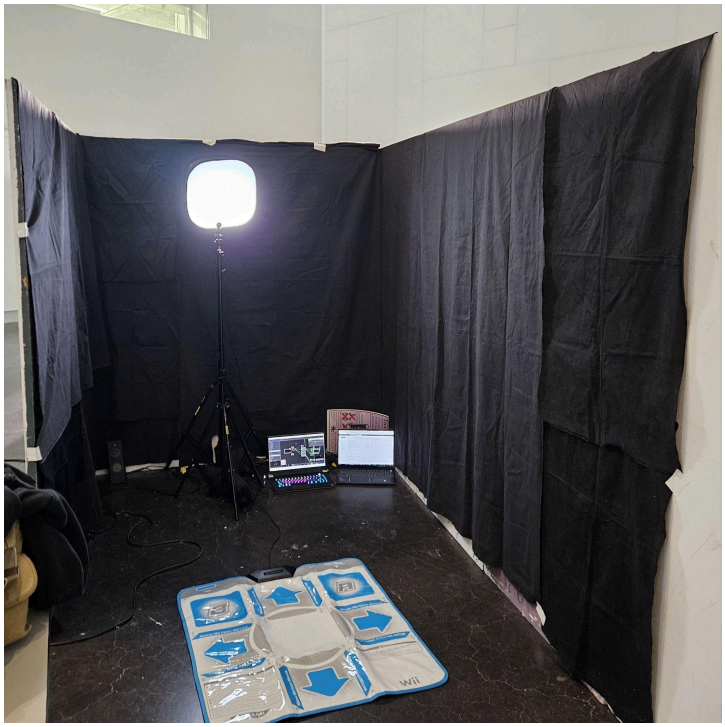
Prisha Jain, *Chromadance*, 2024

Jain explains her *Chromadance* project as "An immersive dance floor inviting self-discovery through movement." Like my own project, Jain's work relies on audience participation in order to accomplish its goals.

Through my own research, and growing connection to the Touchdesigner community, I stumbled onto Jain's work. Like my piece, It also uses a dance mat to invite audiences to explore and engage with the system they created. Unlike my work however, Jain focuses on visuals as means of tying audiences to their kinetic movement, whereas my piece uses sound. Jain also gathered extensive documentation of her piece and made public her process, so I was able to follow her piece through brainstorming, programming, and the installation phases. I also made note of the way she wrote about her work, to see how I could improve my own writing for artists statements and documentation.

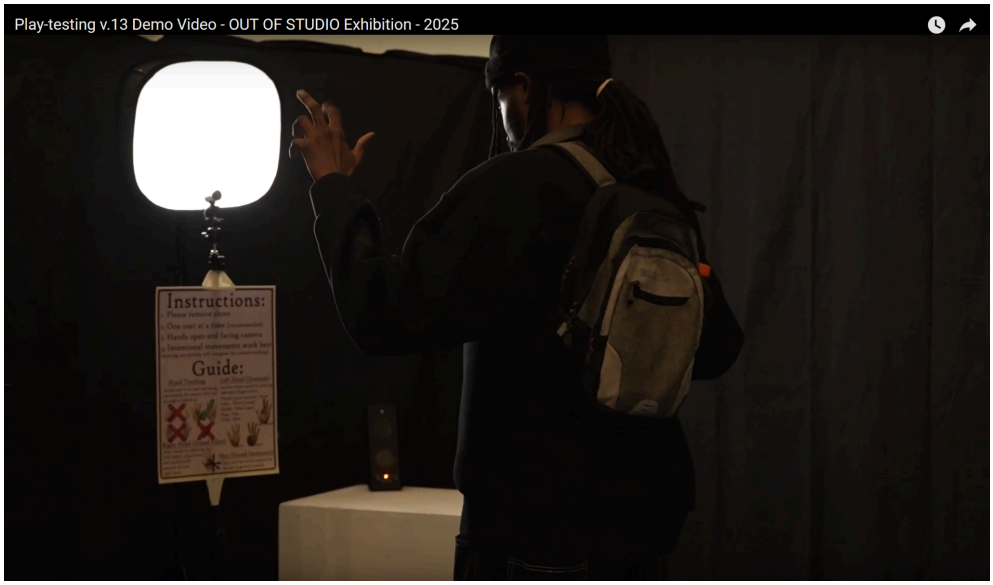
Jain's work was highly similar to mine In both concept and execution. It subtly informed my own installation and inspired my desire to integrate visuals into my piece. Jain's piece was also exhibited to a public audience, and her documentation was important to me. Namely I gleaned from her work, what it was exactly that she focused on presenting. In her portfolio and statements about the piece she mentions the high level of engagement that piece achieved, as well as more technical aspects of her project like how she used a VB audio cable driver to send Spotify audio data to Touchdesigner, I was able to note down for future projects of my own.

Documentation of Work in Exhibition



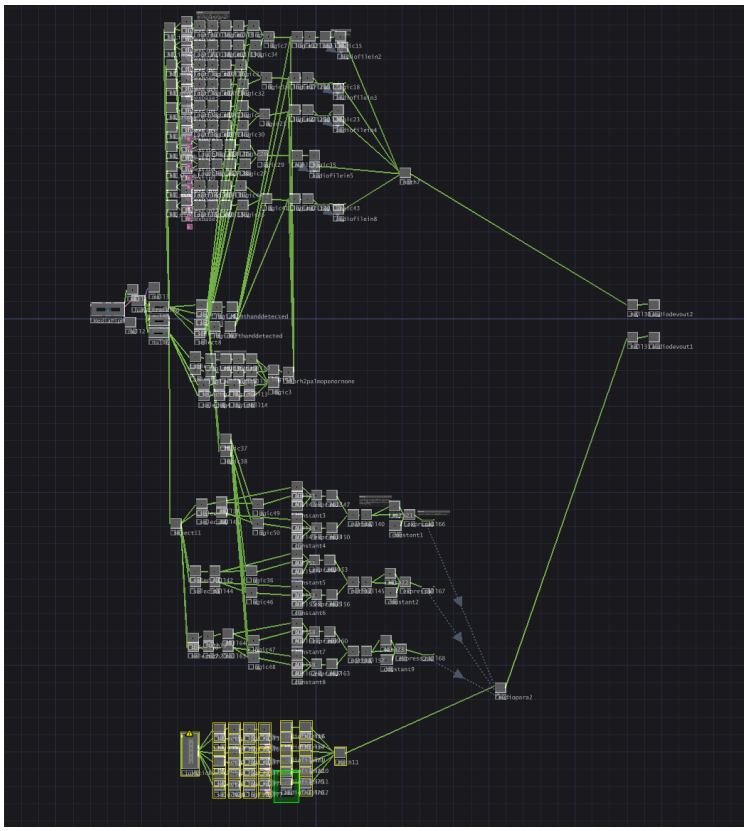
Josh Plante, *Play-testing v.13,* 2025 | Installation Setup

Josh Plante, *Play-testing v.13,* 2025 | Final Installation View



Josh Plante, *Play-testing v.13,* 2025 | Demo Video

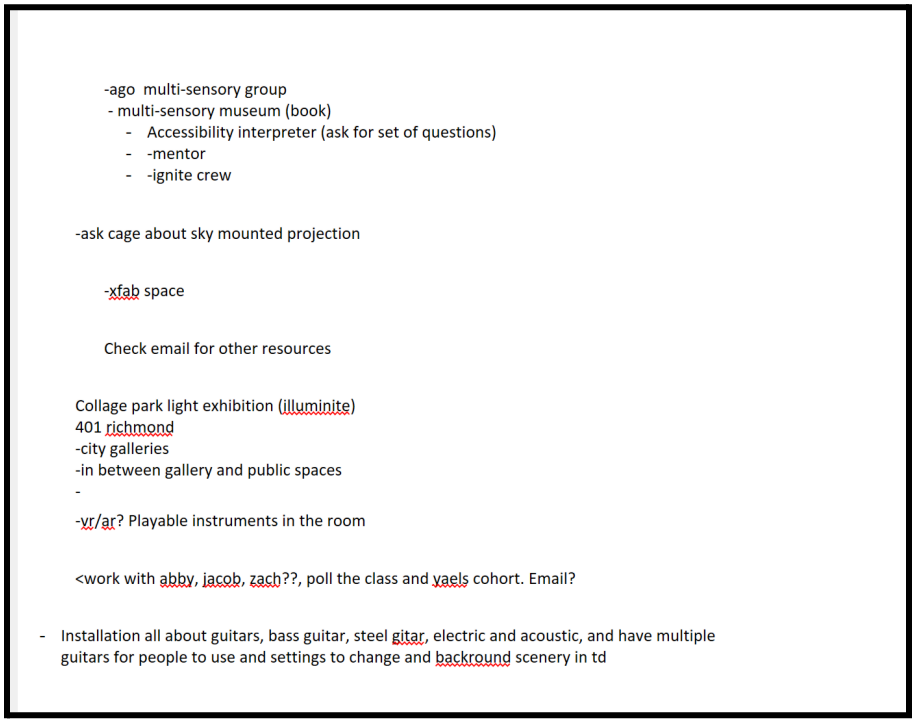
https://www.youtube.com/watch?v=gVMFifk57Sc



Josh Plante, *Play-testing v.13,* 2025 | Touchdesigner WIP photo #2

Josh Plante, *Play-testing v.13,* 2025 | Exhibition Photo #2

Portfolio of Process Work



-ago multi-sensory group
- multi-sensory museum (book)
  - Accessibility interpreter (ask for set of questions)
  - -mentor
  - -ignite crew

-ask cage about sky mounted projection

-xfab space

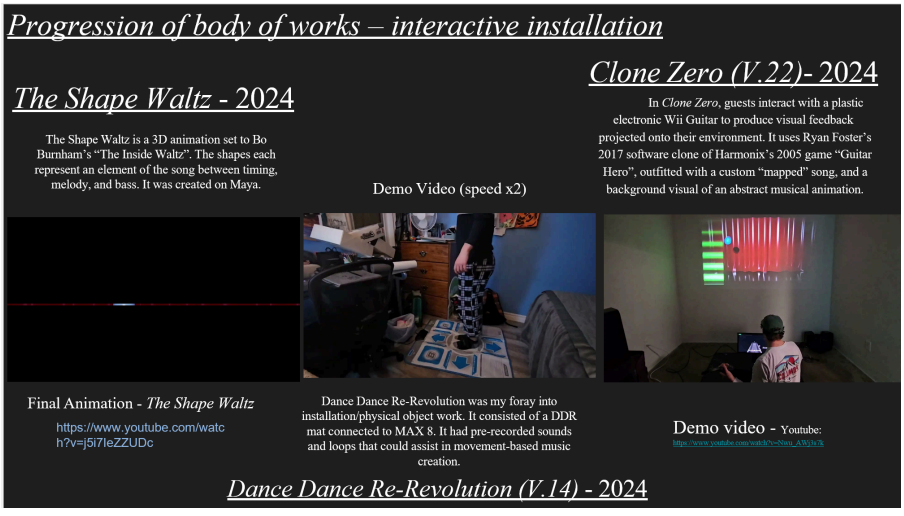
Check email for other resources

Collage park light exhibition (illuminite)
401 richmond
-city galleries
-in between gallery and public spaces
-
-vr/ar? Playable instruments in the room

<work with abby, jacob, zach??, poll the class and yaels cohort. Email?

- Installation all about guitars, bass guitar, steel gitar, electric and acoustic, and have multiple guitars for people to use and settings to change and backround scenery in td

Play-Testing Crit Notes, Research follow-ups, and future project directions brainstorm



Progression of body of works slide from Assignment 4 presentation